

Production of deionized water^{*}

Abstract

The present invention relates to economic and environmentally friendly production of deionized water. Today the production of deionized water is based on the use of cationic and anionic organic resins, which are regularly regenerated with strong acids and strong bases. The purpose of the present invention is the production of deionized water, at a particularly low price, which succeeds in:

1. Increasing the capacity of the used ion exchangers to produce much more deionized water.
2. Limiting the rate of repetition of regenerative processes.
3. Reducing the required quantities of chemical reagents such as e.g., hydrochloric or sulfuric acid and caustic sodium or potassium.
4. Limiting possible accidents during the regeneration process.
5. Minimizing the circulating chemical reagents on the national road network while at the same time there is a reduction in the number of traffic accidents.
6. Limiting accidents during loading, unloading and storage.

The raw material used for deionization is a) water of meteorological precipitation (rain, snow, etc.) and/or b) water originating from desalination plants. Especially in the case of (a), the water is collected from clean and specially formulated cement or membrane surfaces and from roofs of various buildings, inside or outside of the plant. The runoff water is stored in watertight tanks, where leaks and mainly blends of surface and underground water are avoided. The volume of the tanks and the volume of stored water depend on the height and time distribution of any kind of precipitation in the application area. With the help of special pumps, the stored water is led to the deionization columns, which contain suitable ion exchangers, where the deionized water is produced. If for any reason the reserves of the stored water are exhausted, the existing installations can use water from the water supply network or wells.

^{*} *Patent Certificate (Hellenic Industrial Property Organization) No. 1005235/19-06-2006*